Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Please cancel claims 1-20 without prejudice.

21. (New) A recombinant fusion protein monomer comprising:

(i) a binding domain for binding target molecules;

(ii) a functional group domain for eliciting a desired effect on the target molecule or any cellular structures attached thereto; and

(iii) an extension peptide selected from a group consisting of:

(a) an extension peptide located between said binding domain and said functional group domain and containing one or more uncoupled cysteine residues capable of forming disulfide bonds for dimerization, wherein the uncoupled cysteines are located at any position in the range of the first to forty-fifth residue from said binding domain residue directly bonded either to the first or last residue of the extension peptide;

(b) the extension peptide of (a), further comprising a peptide linker consisting of 1 to 50 amino acid residues inserted between the functional group domain and the uncoupled cysteine residue closest to said functional group domain; and

(c) the extension peptide of (b), further comprising an affinity domain for homo- or hetero-multimerization, located between the peptide linker and the uncoupled cysteine residue closest to the functional group domain.

22. (New) A recombinant fusion protein monomer with a multiple-chain binding domain (B) comprising:

i) a first protein chain composed of a first binding subdomain (B_1) connected to an extension peptide, wherein said extension peptide is selected from a group consisting of:

(a) an extension peptide containing one or more uncoupled cysteine residues capable of forming disulfide bonds for dimerization, wherein said uncoupled cysteines are located at any position in the range of the first to forty-fifth residue from said first binding subdomain (B_1) directly bonded either to the first or last residue of the extension peptide; and

(b) the extension peptide of (a), further comprising

a first peptide linker consisting of 1 to 50 amino acid residues connected to the cysteine residue farthest from the first binding subdomain (B_1); and an affinity domain for homo- or

hetero-multimerization connected to said first peptide linker at the end not connected to the first binding subdomain (B_1); and

ii) a second protein chain selected from a group consisting of:

(a) a protein chain consisting of a second binding subdomain (B_2) connected to a functional group domain, wherein the second binding subdomain (B_2) may or may not be the same as the first subdomain (B_1), and

(b) the protein chain of (a), further comprising a second peptide linker consisting of 1 to 50 amino acid residues inserted between the second binding subdomain (B_2) and the functional group domain, wherein the first and second binding subdomains compose the binding domain (B) of said protein monomer for binding target molecules.

23. (New) The recombinant fusion protein monomer according to claim 22, further comprising n-2 additional protein subdomain chains; wherein n is an integer equal to or greater than 3 the binding domain (B) of said recombinant fusion monomer is composed of n binding subdomains (B_1, B_2, ... , B_n) from n protein chains; and said each additional protein subdomain chain consists of a binding subdomain.

w/d - no linker required for Group I.

24. (New) The recombinant fusion protein monomer according to claim 21 or 22, wherein at least one of said peptide linker is a flexible peptide linker containing one or more non-bulky amino acids.

25. (New) The recombinant fusion protein monomer according to claim 24, wherein the non-bulky amino acid is glycine, alanine, serine, glutamine, glutamic acid, asparagine or aspartic acid.

26. (New) The recombinant fusion protein monomer according to claim 25, wherein the flexible peptide linker has a sequence represented by I(S/A)T(K/Q)AS$(G_4S)_n$GGPE, wherein n is an integer ranging from 0 to 8.

27. (New) The recombinant fusion protein monomer according to any one of the previous claims, wherein the functional group is an enzyme used in prodrug transformation, detection, decomposition or formation of materials;

a protein containing a toxin-functional group with cytotoxicity;

a virus for gene therapy, a compound with cationic tail for delivering DNA;

a drug compound;

a liposome for drug delivery; or

a biosensor for real time detection of target molecules.

28. (New) The recombinant fusion protein monomer according to claim 27, wherein the protein containing a toxin-functional group is an immunotoxin.

29. (New) The recombinant fusion protein monomer according to claim 28, wherein the immunotoxin is *Pseudomonas* exotoxin A or a functional equivalent thereof.

30. (New) The recombinant fusion protein monomer according to any one of claims 21-29,wherein the binding domain or binding subdomain is N-terminal and the functional group domain is C-terminal, respectively to all the uncoupled cysteines in the extension peptide; or the binding domain or binding subdomain is C- terminal and the functional group domain is N-terminal, respectively to all the uncoupled cysteines of said recombinant fusion protein monomer.

31. (New) A covalent homodimer or heterodimer formed between any two recombinant fusion protein monomers of claims 21 - 30, via at least one intermolecular disulfide bond between uncoupled cysteines from each said recombinant fusion protein monomer.

32. (New) A covalent heterodimer formed between any one of the recombinant fusion protein monomers of claims 21-30 and an additional recombinant fusion protein monomer via at least one disulfide bond between uncoupled cysteines from each said recombinant fusion protein monomer, wherein the additional recombinant fusion protein monomer consists of a binding domain and an extension peptide connected thereto, wherein extension peptide is selected from a group consisting of:

(a) an extension peptide containing one or more uncoupled cysteine residues, located at any position in the range of the first to forty-fifth residue from said binding domain directly bonded either to the first or last residue of the extension peptide; and

(b) the extension peptide of (a), further comprising:

a peptide linker consisting of 1 to 50 amino acid residues connected to the cysteine residue farthest from the binding domain; and an affinity domain for homo- or hetero-

multimerization connected to said peptide linker at the end not connected to the binding domain.

33. (New) The heterodimer according to claim 32, wherein the peptide linker of the additional recombinant fusion monomer is a flexible peptide linker containing one or more non-bulky amino acids.

34. (New) The heterodimer according to claim 33, wherein the non-bulky amino acid is glycine, alanine, serine, glutamine, glutamic acid, asparagine or aspartic acid.

35. (New) The homo- or heterodimer according to any one of claims 31 - 34, wherein at least one of the binding domain is an antibody or a fragment thereof.

36. (New) The homo- or heterodimer according to claim 35, wherein the fragment is an F_{ab}.

37. (New) A recombinant plasmid comprising a polynucleotide encoding any one of the recombinant fusion protein monomers of claims 21 - 30 or any one of protein chains described in claims 22 – 30.

38. (New) A transformed host cell comprising the recombinant plasmid of claim 37.

39. (New) A pharmaceutical composition comprising any one of the recombinant fusion protein monomers of claims 21-30 as an active ingredient.

40. (New) A pharmaceutical composition comprising any one of the homo- or heterodimers of claims 31 - 36 as an active ingredient.

41. (New) A method for producing any one of the recombinant fusion protein monomers of claims 21 - 30 or any one of the protein chains described in claims 22 - 30, comprising the steps of:

(a) constructing a recombinant plasmid of claim 37;

(b) transforming a host cell with the recombinant plasmid of step (a);

(c) culturing the transformed host cell with an appropriate culture medium; and

(d) recovering the recombinant polypeptide from an extract of the transformed host cell or the culture media.

42. (New) The method according to claim 41, wherein the binding domain is an antibody F_d fragment and further comprising the step of:

(e) adding antibody light chains to the product of step (d), followed by oxidation to yield an F_{ab} fragment.

43. (New) A method for producing any one of the homo- or heterodimers of claims 31 - 36 comprising the steps of:

(a) constructing a recombinant plasmid of claim 37;

(b) optionally constructing a recombinant plasmid comprising a polynucleotide encoding an additional recombinant fusion protein monomer;

(c) transforming a host cell with the recombinant plasmid of step (a) and/or optionally the recombinant plasmid of step (b);

(d) culturing the transformed host cell with an appropriate culture medium; and

(e) recovering the recombinant polypeptide from an extract of the transformed host cell or the culture medium, wherein the additional recombinant fusion protein monomer consists of a binding domain and an extension peptide connected thereto, wherein the extension peptide is selected from a group consisting of: (a) an extension peptide containing one or more uncoupled cysteine residues, located at any position in the range of the first to forty-fifth residue from said binding domain residue directly bonded either to the first or last residue of the extension peptide;

(b) the extension peptide of (a), further comprising:

a peptide linker consisting of 1 to 50 amino acid residues connected to the cysteine residue farthest from the binding domain; and an affinity domain for homo- or hetero-multimerization connected to said peptide linker at the end not connected to the binding domain.

44. (New) The method according to claim 43, wherein the peptide linker is a flexible linker peptide containing one or more non-bulky amino acids.

45. (New) The method according to claim 44, wherein the non-bulky amino acid is glycine, alanine, serine, glutamine, glutamic acid, asparagine or aspartic acid.

46. (New) The method according to any one of claims 41 - 45, wherein the host cell of step (c) is a yeast.

47. (New) The method according to any one of claims 43 - 45, further comprising the steps of:

(f) denaturing the recovered recombinant polypeptide under a reducing condition;

(g) forming a dimer by renaturing the denatured recombinant polypeptide under an oxidizing condition; and

(h) purifying the dimer.